

# CNCF “Cochrane Corner”

## Summary of Cochrane Review – with consideration for nursing practice

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*This is a commentary on a Cochrane Review. The full citation and the names of the researchers who conducted the Review are listed in the Reference section below.*

Title: **Surfactant therapy for bronchiolitis in critically ill infants.**

### Background

Viral bronchiolitis is a common cause of respiratory failure in children. About 10 to 15% of previously healthy children are likely to be admitted to an intensive care unit (ICU) if they become hospitalised by bronchiolitis, and about half of these children will need mechanical ventilation. Children with pre-existing conditions, such as congenital heart disease, chronic lung disease and children who are immunocompromised are at a much greater risk of developing bronchiolitis.

The viruses that cause bronchiolitis cause the small airways in the child's lungs to be obstructed, this causes them to cough and wheeze. Bronchiolitis has no definitive treatment. Although many different therapies for bronchiolitis have been identified and studied, there isn't currently enough evidence to support the use of any of them and children with bronchiolitis are often only given supportive care.

Surfactant is a substance made up of proteins and lipids that is required for normal functioning of lungs. Severe bronchiolitis may also cause children to become deficient in surfactant. Surfactant has been suggested as a possible therapy for bronchiolitis as it is able to make the alveoli more stable and helps to improve mechanical properties of lungs. Therefore it has been suggested that administering surfactant into the lower airways might help children who develop severe bronchiolitis to recover from the disease more quickly.

### Objective/s (information similar to Review Question)

To determine the efficacy of surfactant for the treatment of acute bronchiolitis in mechanically ventilated children when compared to placebo, no intervention or standard care

### Intervention/Methods (information similar to Study Characteristics)

The authors searched for trials that looked at the outcomes of children who had been given surfactant after a diagnosis of acute viral bronchiolitis that required them to be intubated and mechanically ventilated. They included both children who had been previously healthy and those who were at high risk (i.e. those with congenital heart disease, chronic lung disease etc.) They included all randomised controlled studies, including both those that did and those that did not use a placebo control.

The main outcomes they looked at were: mortality, duration of mechanical ventilation, duration of ICU stay and reported adverse effects.

### Results

Three trials were included in the review, giving a total of 79 patients (39 received surfactant and 40 were controls). One study used a placebo control.

#### Outcomes:

**Mortality:** No mortality was reported in any studies.

#### Duration of mechanical ventilation

All three studies showed that surfactant therapy reduced the length of time that a child needed to be mechanically ventilated, in one study this did not reach statistical significance. Combining the three studies showed no significant decrease in duration of mechanical ventilation, but a non-significant trend (2.6 days shorter).

### *ICU Length of Stay*

All three studies showed that surfactant therapy reduced the length of stay in ICU, in one study this did not reach statistical significance. Combining the three studies showed a significant decrease in duration of ICU stay by 3.3 days.

### *Adverse Effects*

No study in the review reported any adverse effect caused by taking surfactant.

### **Conclusions**

Treating children with bronchiolitis who have been mechanically ventilated, with surfactant may be effective. These three small trials suggest that surfactant therapy for bronchiolitis might shorten the length of ICU stay, without having any serious adverse effects. However additional research is needed to clarify these findings.

### **Implications for Practice**

Bronchiolitis can cause children to become seriously ill and no definite therapy is available. This review suggests that surfactant therapy might be an effective treatment for bronchiolitis in children who have needed to be mechanically ventilated. This could change the standard care for these sick children.

However this review is based on three small studies and, although the results are promising, larger trials will need to be run to confirm this effect and answer questions about how the surfactant is best administered before guidelines will be changed. The three trials in the study adopted different approaches for administering the surfactant, one administered it after 12 hours of mechanical ventilation, another after 24 hours of mechanical ventilation and another gave two doses of surfactant. It is not clear how these differences in doses and timings might modify the effect of the surfactant therapy and these questions will need to be addressed before new guidelines are put into place.

### **PRIORITY**

#### **Citation:**

Jat KR, Chawla D. Surfactant therapy for bronchiolitis in critically ill infants. *Cochrane Database of Systematic Reviews* 2015, Issue 8. Art. No.: CD009194. DOI: 10.1002/14651858.CD009194.pub3.

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